State of Louisiana
Department of Coastal Protection and Restoration
Operations Division

2010 Annual Inspection Report

for

DELTA WIDE CREVASSES (MR-09)

State Project Number MR-09
Priority Project List 6

October 7, 2010
Plaquemines Parish

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I. Introduction

Delta Wide Crevasses (MR-09) was authorized by Section 303(a) of Title III Public Law 101-646, the Coastal Wetlands Planning Protection and Restoration Act (CWPPRA) enacted on November 29, 1990 as amended. The Delta Wide Crevasses Project was approved on the sixth (6^{th}) Priority Project List and project area is located within two wildlife management/refuge areas, both in Plaquemines Parish, La. The northern half of the project is located in the Delta National Wildlife Refuge. The southern half is located in the Pass-a-Loutre State Wildlife Management Area (PALWMA). The necessary agreements to allow project construction and operation to proceed have been executed between OCPR and the above-referenced parties.

II. Inspection Purpose and Procedures

The purpose of the annual inspection of the Delta Wide Crevasses Project (MR-09) is to evaluate the constructed project features to identify any deficiencies and prepare a report detailing the condition of the project features and recommended corrective actions needed. Should it be determined that corrective actions are needed, OCPR shall provide, in the report, a detailed cost estimate for engineering, design, supervision, inspection, and construction contingencies, and an assessment of the urgency of such repairs (O&M Plan August 1, 2007). The annual inspection report also contains a summary of maintenance projects and an estimated projected budget for the upcoming three (3) years for operation, maintenance and rehabilitation. The three (3) year projected operation and maintenance budget is shown in Appendix C. A summary of past and maintenance projects completed since completion of the initial construction of the Delta Wide Crevasses Project in 1999 are outlined in Section IV.

This annual inspection of the Delta Wide Crevasse Project (MR-09) was held on October 7, 2010 on a clear and cool day with winds NW at 5 mph. At the time of the inspection, 11:00 AM, the Mississippi River Stage at the COE Gage in Venice, La. was +2.5 feet NAVD 88. In attendance were Tom Bernard, OCPR; and Joy Merino, NMFS. The inspection team met with Louisiana Department of Wildlife and Fisheries (LDWF) personnel at the LDWF/ PALWMA Camp/Headquarters where we were taken to each crevasse site in a smaller boat that allowed us to take soundings in each one of the cuts.

III. Project Description and History

The project area is located in Plaquemines Parish to the southeast of Venice, Louisiana on the active Mississippi River Delta (figure 1). This project utilizes the major process that forms subaerial land in the lower Mississippi River Delta, the formation of crevasses. Crevasses are breaks in the levee that allow overbank deposition of sediments to occur in adjacent interdistributary receiving bays. This deposition of sediments causes land formation that is controlled by the processes of distributary mouth-bar islands. Coleman and Gagliano (1964) ordered the mouth-bar island process into crevasse sub-delta and crevasse-splay based on relative size. Crevasse sub-deltas consist of relatively large receiving bays that have areal extents of 115-154 sq mi. (300-400 sq km) and depths of

32-49 ft (10-15 m). The process by which these sub-deltas are formed is referred to as "bay filling" (Coleman and Gagliano 1964). Crevasse-splays are a smaller sub-unit that are distinguished from sub-deltas in that their size, frequency, and expected life spans are smaller generally having a receiving bay extent of approximately 0.234 sq mi. (0.59 sq km) (Boyer 1996).

The project consists of maintaining presently existing crevasse-splays, the construction of new crevasse-splays, and future maintenance of selected crevasse-splays in both the PALWMA and the Delta National Wildlife Refuge (DNWR). The PALWMA covers 66,000 ac (26,709 ha) between Pass-A-Loutre and South Pass and is owned and managed by the LDWF. The DNWR covers 48,000 ac (19,425 ha) from just north of Main Pass southward to Pass-A-Loutre and is owned and managed by the U.S. Fish and Wildlife Service (USFWS). It is understood that the natural cycle of crevasse-splays is a temporary event that is rarely active for more than 10 to 15 years. This process of crevasse-splay deposition, building, and subsidence will all be considered in the evaluation of this project.

The usefulness of crevasses as a tool of wetland and coastal management on the Mississippi River Delta began to be realized in the early 1980's. The Louisiana Office of Coastal Protection and Restoration (OCPR) constructed three new crevasses in 1986 (on Pass-A-Loutre, South Pass, and Loomis Pass) that produced over 657 ac (266 ha) of emergent marsh from 1986 to 1991, and four crevasses in 1990 (two each on South Pass and Pass-A-Loutre) that produced over 400 ac (162 ha) of emergent marsh from 1990 to 1993 (LDNR 1993; Trepagnier 1994). Thirteen crevasses included in the OCPR Small Sediment Diversions Project cumulatively produced 313 ac (127 ha) of emergent marsh between 1986 and 1993; land growth rates ranged from 28 to 103 ac (11.3 to 41.7 ha) per crevasse for the older crevasses (4 to 10 years old) and 0.5 to 12 ac (0.2 to 4.9 ha) for the younger crevasses (0 to 2 years old) (LDNR 1996). Boyer et al. (1997) concluded that crevasses in the DNWR accumulated land at about 11.6 ac/yr (4.7 ha/yr), but subaerial growth did not occur for 2-3 years after the crevasses were constructed.

The project features covered by this inspection are inclusive of and are identified as the Delta Wide Crevasses (MR-09). The intention of the annual inspection is to maintain the project in a condition that will generally provide the anticipated benefits that the project was based on. There is no requirement that this project function to any standard beyond the 20-year economic life; except that it is not left as a hazard to navigation or a detriment to the environment. A site map showing the project boundary within the Delta Wide Crevasses project benefit area is shown in Appendix A identifying all of the project features within the project area.

IV. Summary of Past Maintenance Projects

General Maintenance: Below is a summary of completed maintenance project:

Originally dredged in 1999, crevasses No. 9, 11, and 12, in the PALWMA had silted in and did not function as originally constructed. The first maintenance cycle took place in 2005. This maintenance dredging contract re-dredged those three crevasses to their original design dimensions, and dredged two new crevasses in the same area. Those were NC-1, and NC-3. Also constructed in this maintenance contract was crevasse No. 81, which is located on Baptiste Collette in the Delta Wildlife Management Area. See Appendix A for locations of the maintenance sites.

V. Inspection Results of Crevasses Dredged in 2005 (See Appendix "B" for Project Photos)

A. Crevasse No. NC-1: (1,000 ft. X 100 ft. X -8.0 ft. NAVD 88) This 2005 new-crevasse appears to be in good condition. Soundings indicate that it has retained slightly more than half of its originally constructed depth. The interior indicates that river water is flowing very well through the channel carrying large amounts of sediment, and the spoil from the dredging of the crevasse is heavily vegetated throughout the deposited bay area.

B. Crevasse No. NC-3: (1,400 ft. X 100 ft. X -8.0 ft. NAVD 88) This is the second of the two new 2005 crevasses and the only one on Main Pass. It is functioning very well, and flowing with a very swift current bringing much needed sediments into the interior bays. Our soundings show that the crevasse is maintaining its original depth throughout its channel length and the spoil from the crevasse dredging has completely vegetated. New spoil deposits from this high water season can also been seen in the inner bay.

C. Crevasse No. 9: (2,200 ft. X 75 ft. X -8.0 ft. NAVD 88) Good flow is being maintained in this dog-leg shaped previously dredged crevasse (1999). Its location allows for swift currents during the present high river stages. Soundings indicate that this crevasse has maintained 75% of its original depth throughout its length. The spoil deposition from this cut is very heavily vegetated and seems to have increased in size by the sediments flowing into the area.

D. Crevasse No. 11: (2,600 ft. X 100 ft. X -8.0 ft. NAVD 88) This re-dredged crevasse (1999) has maintained a good flow throughout its length. Soundings indicate that it has maintained over 80% of its original depth throughout, which is partly due to the current in this cut being more than adequate. All of the spoil deposited in the inner lagoon areas has vegetated very heavily and appears to be in excellent condition. The last three years of high water allowed much sediment to enter the interior marshes.

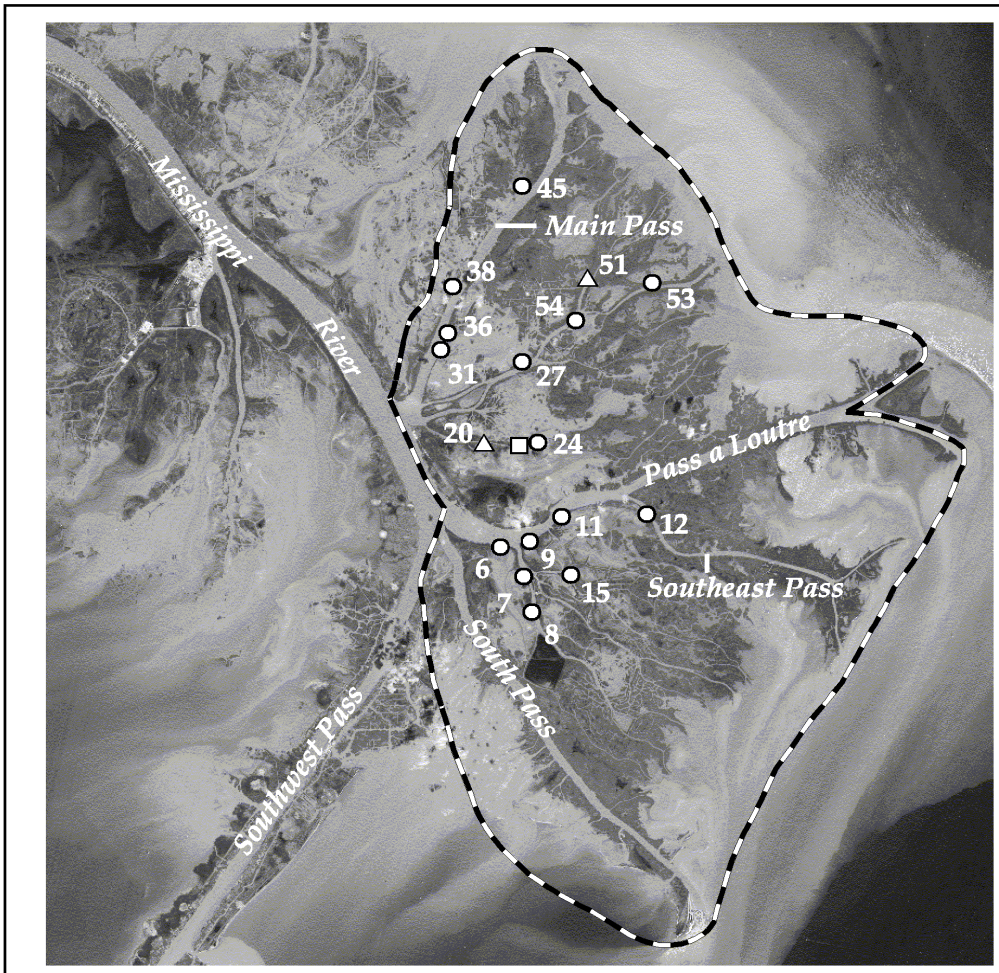
E. Crevasse No. 12: (2,000 ft. X 75 ft. X -8.0 ft. NAVD 88) Despite being located off of the main channel, this crevasse appears to be functioning very well. There is sufficient current to carry sediments to the inner section of the bays and lagoons despite maintaining only slightly more than half its original depth. This crevasse had been originally dredged in (1999).

F. Crevasse No. 81: (1,200 ft. X 100 ft. X -8.0 ft. NAVD 88) This crevasse is located off of Baptiste Colette in the Delta Wildlife Management Area. The current in the crevasse is strong, since it is located in close proximity to the Mississippi River. Despite soundings indicating that the mouth of this crevasse has silted up from the large amounts of sediments moving into the cut by the river currents, there is still some sediments being carried into the interior marsh area.

VI. Conclusions and recommendations

As a result of the inspection, the team concluded that all project features are functioning and should continue to do so without any immediate maintenance; however, abnormal high river stages, during the past three seasons, caused more than normal shoaling in the Southwest Pass channel. This was brought on by more Mississippi River dredging by the Corps of Engineers and the deposition of that material in the flowage in Pass-a-Loutre. This additional shoal material, combined with the high river flows, added to the sediments introduced into the pass and then into the crevasses areas. Those amounts of sediments were noticeable during the inspection and are contributing highly to the success of this project. These high sediment loads also contributed to the amount of shoaling that occurred in the Crevasses. We could most likely forego cleaning/dredging out any of the crevasses in the coming year and instead plan to conduct maintenance dredging in 2012 perhaps along with some new sites in the PALWMA. OCPR and NMFS have identified two existing locations, NC-1 & 12, and one new location south of NC-1 identified by LDWF as the Ducks Unlimited Canal, where maintenance dredging could be done soon. We will soon meet with LDWF to determine more additional sites that would be agreeable to all parties. It would be more feasible to have 5 or 6 sites that can be dredged (i.e. more benefits for the cost) rather than mobilizing equipment for fewer sites. Therefore; it is recommended that no immediate action be taken for maintenance at this time, but instead initiate plans to investigate/survey some additional areas to be done in 2012. It is also recommended that we not return to Baptiste Collette to either maintain or dredge new crevasses at this time since the additional sites can be found in the Pass-a-Loutre area. There is such an abundance of currents and sediments funneled through this distributary, that these crevasses tend to shoal up very quickly within the first high water period after dredging rendering them inefficient for the long term (5-years plus) such as those in the Pass-a Loutre area.

APPENDIX A
Project Features Map



APPENDIX B
Photographs

Crevasse No. 12 (view 1) Looking into crevasse from South East Pass.

Crevasse No. 12, (view 2) Looking west. Vegetated Spoil area in center of view.

Crevasse No. 11, (view 1) Looking in from Pass a Loutre. Crevasse has maintained its constructed width throughout.

Crevasse No. 11, (view 2), Heavily vegetated crevasse dredging spoil in bay area, foreground.

Crevasse No. NC-1, (view 1) Looking south. Notice heavily vegetated construction easement from crevasse dredging.

Crevasse No. NC-1, (view 2) Vegetated spoil deposition in inside bay area, and also large amounts of heavy sediments.

Crevasse No. 9, (view 1) From Pass-a-loutre looking south into crevasse. Original width has been maintained.

Crevasse No. 9, (view 2) Crevasse end looking at spoil area vegetation and huge amounts of sediments from the pass.

Crevasse No. NC-3, (view 1) Looking into crevasse from South Pass showing heavy vegetation on both banks.

Crevasse No. NC-3, (view 2) Inside crevasse looking east into open bays. Notice heavy material buildup in center of view. This crevasse has maintained all of its original dimensions.

Crevasse No. 81, (view 1) Looking south from Baptiste Collette channel. Material build-up at channel edge prevented the inspection team from entering the channel.

Crevasse No. 81, (view 2) Crevasse showing heavy amount of vegetated spoil area and newly deposited sediments.